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**Type:** REGULATORY & NONREGULATORY / **Related Topic Areas:** Bicycle & Pedestrian Facilities; Capital Improvement Program; Facilities Management; Historic Preservation; Impact Fees; Land Use & Development Regulations; Official Map; Parking; Public Transportation; Subdivision Regulations; Zoning Regulations

# Roads & Highways

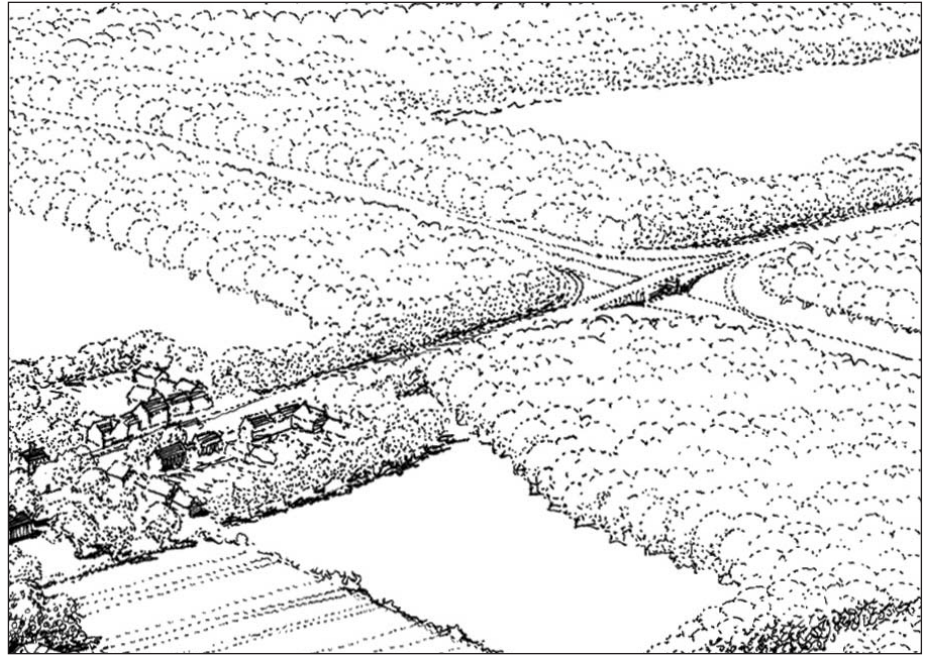
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## Overview

Because of Vermont’s mountainous terrain, the old saying “you can’t get there from here” often seems more true than not. Our rural state has an extensive road network—over 14,000 miles of road that are maintained for year-round use, including more than 11,000 miles of town highway that are largely the responsibility of local government.

The laying out and construction of public highways and private turnpikes, or toll roads, was critical to Vermont’s early settlement and later development. Road taxes, payable in currency or labor, were one of the first taxes levied by municipal government. The local road network in many communities reached the extent of its development during the nineteenth century, as shown on maps from that era. Many of these roads, initially designed to carry horse-drawn wagons and sleighs, continue to link neighbors and communities. They form the foundation of the state’s existing road system.

Some roads that once served now-abandoned hill farms and settlements have since been “thrown up” and formally returned to adjoining landowners. In other cases, these old rights-of-way have been retained by communities as seasonally maintained



**While good roads and interstate highways are a boon to residents and businesses, they have profound impacts on the visual character and quality of life of Vermont’s historic communities. Fiscal management of existing roads, standards and design of future roads, the interaction of land use and road functions, and environmental impacts of roads are only some of the issues municipalities need to consider in addressing roads and highways.**

Class 4 roads or legal trails for recreational use. A few “ancient roads” also still exist on paper—in deeds and other land records—if not visibly on the ground. These public rights-of-way, often uncovered during title searches or boundary disputes, have caused problems for landowners who unwittingly built within them. As such, they were the subject of 2006 legislation (Act 178), which requires municipalities to identify and map or otherwise abandon their interest in these “unidentified corridors.”

Town highway classifications found in statutes are tied to state funding for local roads. Class 1, 2, and 3 roads qualify for available funding under state programs. Class 4 roads and legal trails do not.

The introduction of the automo-

bile in the twentieth century required improvements in road design, construction, and maintenance—upgrades that have occurred incrementally, as local and resources have allowed. The local road system has also been affected by major events such as the flood of 1927, which wiped out many of the state’s bridges, and the construction of interstates in the 1960s, which opened Vermont up to renewed growth, development, and traffic.

Today, Vermont communities continue to struggle with road issues—rising infrastructure and maintenance costs, traffic congestion and safety concerns, the acceptance of new development roads, and what to do with old roads that no longer receive much use.

### Vermont’s Road Network

**State Highways** 2,708 miles  
Interstates 320 miles

**Town Highways** 11,382 miles  
Class 1 135 miles  
Class 2 2,728 miles  
Class 3 8,519 miles  
Class 4 1,541 miles

Source: VTrans (2006).

## Application

The upkeep of public roads to safely access adjoining land and to support a highly mobile, vehicle-dependent society represents a substantial long-term capital investment and significant ongoing expense. The local legislative body is legally responsible for laying out, accepting, discontinuing, and maintaining town highways—including bridges, culverts, and related infrastructure—and for other improvements within public rights-of-way. Identifying, planning, and budgeting for major road improvements makes good fiscal sense and is required under state and federal funding programs.

The link between transportation and land use has also become more apparent in recent years, especially in rapidly developing communities. This increasingly calls for consideration of:

- *the impact of development* on local roads, including traffic congestion, safety, and infrastructure capacity;
- *the impacts of new or reclassified roads on local development patterns*, especially

where they may fragment existing neighborhoods and resource lands or open up new areas to development;

- *accommodating multiple users and modes of transportation*, including cyclists and pedestrians;
- *road “connectivity”* (interconnectedness), access management, and traffic calming to increase the efficiency and safety of the road network for all users;
- *“context sensitive” road design* that preserves the neighborhood, rural or scenic character of the area; and
- *the impacts of road construction and maintenance on water quality*, resulting from stormwater runoff and erosion and the storage and use of salt.

These types of concerns are now being addressed more specifically in local plans and related regulations, ordinances, and programs. All proposed road programs and major improvement projects should conform to a community’s duly adopted municipal plan—including the plan’s required transportation and land use ele-

ments—and its adopted capital budget and program.

Most plans include at least a general description of the community’s road network (for example, the town highway map), a list of scheduled road improvements, and policies and objectives for maintaining and improving local roads. The plan may also call for more extensive inventories or studies of the town’s transportation network as needed to support ongoing maintenance programs, anticipated infrastructure improvements, and locally adopted transportation policies, programs, and regulations.

## Infrastructure Inventories

Fairly detailed inventories of local highway infrastructure and equipment are now required to document capital assets under new municipal accounting standards and for inclusion in municipal capital budgets and programs. (See related topic papers.)

Road inventories typically include a systematic assessment of the physical condition of the local road network, including road segments, intersections, bridges, culverts, drainage ditches, and related infrastructure within the road right-of-way. This information then forms the basis for identifying and scheduling regular maintenance and repair activities and more substantial road reconstruction and upgrades that require more significant capital investments. Many municipalities formally, or informally, identify road segments for different levels of maintenance, based on their condition and use.

Several manual or electronic inventory systems that incorporate databases and mapping components are available for local use. These include both road surface management systems (RSMSs) and bridge and culvert inventory systems. The Agency of Transportation has developed an integrated, online database for recording and updating bridge and culvert data (the Vermont Online

### Town Highway Classifications (19 V.S.A. §302)

Designation	Description
Class 1	State-designated town highways that serve as extensions of state highway routes and carry a state highway number
Class 2	Locally designated town highways that carry more than normal amounts of traffic and connect neighboring towns
Class 3	Other town highways that are maintained for year-round use by pleasure cars
Class 4	All other town highways; minimal maintenance requirements
Legal Trail	Public rights-of-way that are not highways; no statutory maintenance requirements
Unidentified Corridor	Town highways that were laid out as highways, but are not on town highway maps and are not clearly observable by physical evidence of their use as a highway or trail

Town highway classifications found in statutes are tied to state funding for local roads. Class 1, 2, and 3 roads qualify for available funding under state programs. Class 4 roads and legal trails do not.

## Town Highway Infrastructure Studies

Infrastructure studies prepared according to VTrans guidelines qualify municipalities for additional funding under state aid incentive programs. These studies, updated every three years, include inventories of the location, size, and condition of local roads, bridges, causeways, culverts, and any highway-related retaining walls for Class 1, 2, and 3 town highways. Infrastructure studies, and the adoption of related codes and standards, are also required for local funding eligibility under certain Federal Emergency Management Agency (FEMA) programs.

Bridge and Culvert Inventory Tool or VOCBCIT). Regional planning commissions and the Chittenden County Metropolitan Planning Organization have been charged by the state to help member municipalities conduct infrastructure inventories as funding allows. Inventory programs and technical assistance are also available through the Vermont Local Roads Program and from private contractors.

Regional planning commissions are also working with member communities to conduct Road Safety Audit Reviews (RSARs). These include evaluations of road intersection safety hazards and recommendations for low-cost safety improvements.

Local inventory data must be compatible with state mapping standards available from the Vermont Center for Geographic Information (VCGI) and be made available to VCGI, the Agency of Transportation (VTrans) and the public. Bridge and culvert inventory data are also being used by the Agency of Natural Resources in geomorphic assessments of local drainage systems to help determine the effects of roads on rivers and streams.

Inventory data are especially useful in identifying and ranking needed road improvements. At the state level,

VTrans uses inventory information to determine a road's "sufficiency rating"—a point ranking system ranging from 1 (very poor) to 100 (excellent) that considers a road's structural condition, safety features, and service capacity. These ratings are used to set priorities in distributing the state's annual town highway allocations. A similar point system is used to rate the structural and functional deficiency of bridges.

## Traffic Studies

While infrastructure inventories focus on the physical condition of the road network, traffic studies examine local traffic conditions. The most common municipal traffic studies are those required by state law to set local speed limits (23 V.S.A. §1007). Traffic studies are also used to evaluate traffic volumes and vehicle movements in relation to the functional or carrying capacity of the local road network. A road's functional classification is based on the function it is intended to serve. Information regarding the functional class of a particular road is available from the regional planning commission and VTrans.

Traffic and turning movement counts provide useful information regarding the number, type, and speed

of vehicles moving along roads and through intersections during different times of the day and week (for example, during peak morning and afternoon commuting hours). This information can then be used to evaluate traffic conditions on roads and at intersections—often defined as levels of service (LOS) or measures of relative flow and congestion that range from A (best) to F (worst)—in relation to an adopted standard (for example, a LOS of C). LOS measures factors in traffic volume, speed, delays, and driver expectations. Poor

### Context in Level of Service Standards

A Level of Service of C is often adopted as the minimum standard or threshold below which needed infrastructure or management improvements will be required. This isn't always the case, however. The RT 100/RT 108 intersection in the middle of Stowe Village consistently falls below this standard, but because of its context and the adverse impacts that intersection improvements could have on surrounding properties, it has long been an adopted local policy to accept a lower standard at this intersection.

Functional Classifications	
Classification	Description
Freeway	Limited access highway (e.g., interstate) intended to carry a free flow of traffic over long distances. Highest speeds, mobility.
Arterial	Intended primarily to carry through traffic (e.g., between communities); access to adjoining land is subordinate to this function. Restricted access, higher speeds and mobility.
Collector	Intended to collect and carry local traffic to arterials, and to provide access to adjoining parcels. Moderate speeds, mobility.
Local Road	Intended primarily to provide access to adjoining land. Low speeds, traffic volumes.
Functional classes may be more specifically defined as principal (or major), minor, urban, and rural, depending on their particular context and function within the larger road network	

levels of service generally indicate the need for additional traffic management or road and intersection improvements.

Traffic impact studies required as part of a local or Act 250 permitting process evaluate and predict levels of service based on a number of factors including “trip generation rates”—the number of vehicle trips generated from existing and proposed development. This information is then used to identify the potential impacts of proposed development on local roads and intersections and related infrastructure or traffic management improvements.

## Corridor Studies

Corridor studies examine long-term transportation and development trends within a designated road corridor. These studies usually involve several neighboring communities working through their regional planning commission. Corridor studies have also taken place for major routes within larger urban areas; for instance, a corridor study was recently completed for Spear Street in South Burlington (2004).

Corridor studies provide a comprehensive assessment of existing and future transportation, land use, and

### Benefits of Corridor Management

- Identifies and addresses transportation deficiencies before they turn into critical problems.
- Allows for the development of coordinated transportation and land use solutions along a corridor—a far more effective approach than piecemeal initiatives that may act at cross purposes.
- Brings together diverse stakeholders (local, regional, and state agencies; property owners; and interest groups) to agree on mutually beneficial strategies and ongoing cooperation.
- Saves money by implementing

noncapital intensive strategies, including operational improvements, access management, and local land use policies as an alternative to expensive capital transportation investments.

- Identifies creative strategies for supporting sustainable development within the corridor.
- Ensures that transportation needs are addressed in a manner that preserves and enhances Vermont’s natural environment and the unique character of local communities.

Source: Adapted from the Agency of Transportation’s *Vermont Corridor Management Handbook* (February 2005 draft), prepared by Cambridge Systematics, Inc.

environmental conditions along the corridor; a set of recommended strategies to address future transportation needs; and a list of implementation steps, responsibilities, time lines, and thresholds that trigger needed improvements. These studies are especially useful for identifying and coordinating needed local improvements—and policies and regulations—within a broader, regional context. Findings and recommendations from corridor studies should be discussed and, where appropriate, incorporated into local planning and implementation action.

road or related public works standards may also address other infrastructure within the right-of-way, such as driveways, curbs and sidewalks, signs, and utilities. Local ordinances may include detailed construction and design standards or reference recommended state standards, such as the state’s A-76

### Traffic Calming

Traffic-calming measures are road features that force drivers to slow down through physical changes in the road corridor and also make it easier for pedestrians to cross streets at intersections. In addition to traditional speed bumps and dips, traffic-calming measures include, but aren’t limited to, narrower streets and “neckdowns,” on-street parking, raised crosswalks, curb extensions (bump-outs) at crosswalks, median islands, chicanes (tight curves), roundabouts, and signs. VTrans has also developed a traffic-calming prototype for use on state highways, based on their setting and posted speed limits.

## Road and Traffic Ordinances

Vermont municipalities are authorized under several sections of state law to adopt road and traffic ordinances. The Vermont League of Cities and Towns and the Vermont Local Roads Program both have model ordinances available for local adaptation and use.

A road or highway ordinance often includes standards and procedures for road classifications and reclassifications, highway construction and maintenance, Class 4 roads and legal trails, right-of-way access, posting, overweight vehicles, naming, and road acceptance by the municipality. Local

### Planning Interstate Interchange Area Development

While proximity to the interstate highway network offers development opportunities, those opportunities can lead to unanticipated community challenges. In some locations, large-scale commercial development close to interchanges has led to increased congestion and accidents, reduced levels of service along roads and at nearby intersections, and increasing public costs of mitigating these impacts. The dispersed, autodependent growth patterns emerging at many interchanges can also have detrimental impacts on Vermont’s scenery, environment, and traditional downtowns.

Planning and design for land around interstate interchanges are discussed in the Vermont Interstate Interchange Planning and Development Design Guidelines available online from the Department of Housing and Community Affairs Planning Division.

## State or Local Jurisdiction?

19 V.S.A. §1111

Jurisdiction for approving access onto town road belongs to the Legislative Body, and for state roads VTrans. State statutes however, require that local and state access approvals conform to local land use regulations—resulting in a form of shared jurisdiction. It's therefore especially important for effective access management that local ordinances and regulations are consistent, and are consistently applied. The same may be said for other road standards that are applied under local road ordinances and land use regulations.

standards for development roads, and B-71 standards for driveways.

In the past, many communities adopted national design standards or standards from larger communities that did not fit well within the small town context. As a result, new development roads were overdesigned for the amount of traffic they carried, resulting in speeding and unsafe conditions for motorists and pedestrians, the need for larger maintenance equipment, and the loss of traditional, pedestrian-oriented streetscapes. In recent years, there has been a move to reevaluate and adapt state and local road standards to better fit their setting. A good example for local consideration is VTrans' "State Standards for the Design of Transportation Construction, Reconstruction and Rehabilitation on Freeways, Roads and Streets" (1997). These standards, based on a road's setting and functional class, are intended to be context sensitive and limit the impacts of roads on scenic, historic and environmental resources, and other community values.

Traffic ordinances typically establish speed limits by highway segment, traffic signal and sign standards, and associated traffic and on-street parking regulations that are enforceable through the Vermont Traffic Bureau. In addition to traffic ordi-

nances, many communities are now incorporating self-enforcing "traffic calming" measures in road design and construction, especially for use in residential neighborhoods and areas with high pedestrian and bicycle traffic.

## Development Regulations

Local land use regulations, in particular zoning and subdivision regulations, are an effective means of addressing many road-related issues in the development review process. Local regulations often include requirements and standards for:

- *access approval for lots lacking frontage along a public road or public waters* (as authorized under 24 V.S.A. Chapter 117) (for example, under general zoning or subdivision requirements);
- *minimum lot road frontage*, which may vary by zoning district or type of use (for example, under zoning district dimensional or use standards);
- *access management* to limit, for example, the number and location of curb cuts or driveways per lot and require shared access where appropriate (for example, under subdivision and site plan review);
- *site layout and design* to effectively and safely accommodate traffic and pedestrian circulation (for example, under site plan review);
- *traffic impact studies* to identify impacts on roads and traffic patterns in the vicinity of a proposed

development (for example, under subdivision and conditional use review);

- *road and intersection infrastructure improvements*, to be paid for by the developer, as needed to accommodate traffic generated by the development (for example, under subdivision, site plan, or conditional use review);
- *road, driveway and sidewalk design*, including references to adopted road or public works standards (for example, under zoning access and driveway standards and subdivision road standards); and
- *road acceptance by the municipality*, in accordance with adopted road policies or ordinances such as under subdivision regulations.

As noted, local development review regulations should incorporate or reference related road ordinance or public works standards adopted by the community.

## Project Financing

Municipalities rely on property taxes and several state aid programs to help fund local road and bridge improvements. More information about sources of available funding for a particular project is available from your regional planning commission and the Vermont League of Cities and Towns.

Local participation in regional and state transportation planning programs is also important to implement local transportation plans. This includes maintaining local representa-

### Need Help with Roads?

**Regional Planning Commissions** and the **Chittenden County Metropolitan Planning Organization (CCMPO)** are primary sources of information and assistance for implementing local transportation plans. Extensive resources also are available from the **Vermont Agency of Transportation (VTrans)**, including data, recommended standards, program requirements and manuals (such as the *Agency's Handbook for Local Officials*), and through the **Vermont**

**Local Roads Program** at Saint Michael's College, which offers information, technical assistance, and training for managers and road crews. **The Vermont Better Back Roads Program** offers programs to promote road maintenance and erosion control techniques that protect water quality. The **Vermont League of Cities and Towns (VLCT)** has developed model ordinances and regulations.

Many of these resources are available online through organization websites. See [www.vpic.info](http://www.vpic.info) for links to these organizations.

tion on regional Transportation Advisory Committees (TACs) and active participation in the development of regional transportation studies, plans, and improvement programs (TIPs), which are used to allocate available state and federal transportation funds. Participation in the VTrans' project development process for particular transportation projects is also strongly recommended to see state-funded projects through to completion.

## Access Management

An access permit is needed anytime a developer or property owner wants to put in a driveway, curb cut, or new road intersection along a public highway. Access permits are issued by the Vermont Agency of Transportation (VTrans) for state highways and the local legislative body for access along local roads. Under state statutes, state and local access approvals must also conform to local land use regulations, which generally include at least minimum access and road frontage requirements. This creates some jurisdictional and design issues that can best be addressed through a coordinated and comprehensive local access management program.

Access management programs incorporate a variety of strategies and techniques to manage the number, location, and design of access points along roadways in order to reduce congestion and collisions and to maximize road capacity, function, and safety. The techniques used vary by road type, from very simple driveway and access standards for rural collector roads to more sophisticated traffic management and infrastructure improvement requirements along urban arterials.

A growing number of municipalities are now including access management standards in their local land use regulations for application under subdivision, site plan, or conditional use review, that at minimum:

- incorporate or reference locally adopted driveway and road standards;
- include related access and site circulation standards for both vehicles and pedestrians;
- limit the number and spacing of accesses (curb cuts) by lot, length of frontage, or type of use;
- require the consolidation or relocation of existing accesses where appropriate; and
- encourage or require shared access and off-street connections between lots.

Access management studies may also be required under local regulations for more complex, mixed-use development, or for any development that needs a new or upgraded access onto an already busy or congested street.

Coordination between the review panel, the local legislative body, and VTrans, where necessary, is critical. Application referrals are no longer required under Chapter 117, but are often a good idea. Access permits should be issued following state or local development review to ensure that the access is consistent with the project as it is approved under Act 250 and local land use regulations.

For more information on state and local access management programs, contact VTrans ([www.vtaccessmanagement.info/](http://www.vtaccessmanagement.info/)) or your regional planning commission.

## Scenic Roads

Vermont's concern for preserving roadside beauty dates as far back as 1937, when the Vermont Legislature directed the former State Highway Board to lay out a scenic route extending through the middle of the state from the Massachusetts to the Canadian border. This became Route 100. Vermont's "Scenic Road Law" (19 V.S.A. Chapter 25) was first enacted by the legislature in 1977 to preserve the scenic quality of the state's rural landscape. This law gives municipalities and the state the authority to designate scenic highways.

Local scenic road initiatives can be undertaken by any community group, but must receive the support of the planning commission and legislative body. A systematic inventory of local roads to document their scenic values generally precedes designation. Guidance for conducting scenic road inventories is available from the Vermont Scenery Preservation

### Vermont Byways Program

The Vermont Scenery Preservation Council also oversees the Vermont Byways Program, established by the state in 1996 to integrate the state's scenic road program, under Title 19, with the National Scenic Byways Program. The Vermont Byways Program provides a source of federal transportation funds for road improvements, pedestrian and bicycle facilities, rest areas, recreation areas, interpretive facilities, and cultural and natural resource protection along designated corridors. It can also be used as a marketing tool to promote tourism.

A Vermont Byway is a highway or other public road that has special scenic, historic, recreational, cultural, archeological, and/or natural qualities and has received formal designation

from the Vermont Transportation Board. For byways designation, a nominating committee with broad representation from municipalities along the corridor must inventory and assess all resources within the corridor, define local objectives, and develop a corridor management plan that is based on the active involvement of municipal and regional planning officials, private property owners, and corridor users.

To date, there are seven designated scenic byways and routes in Vermont, including the Connecticut River National Scenic Byway and the Lake Champlain and Molly Stark Trails. More information about the Vermont Byways Program is available through the Scenic Byways Program ([www.vermont-byways.us](http://www.vermont-byways.us)) and your regional planning commission.

### ***The Roadscape Guide: Tools to Preserve Scenic Road Corridors***

*The Roadscape Guide* (2006), produced by the Champlain Valley Greenbelt Alliance, provides tools to help communities permanently preserve viewsheds and scenic gateways along road corridors. This illustrated guide explains how to define study areas, conduct visual analyses, and understand the local landscape. It also explains conservation basics and both regulatory and nonregulatory techniques to protect scenic resources. Copies of the guide were distributed to Vermont municipalities and are also available from the Vermont Forum on Sprawl ([www.vtsrawl.org](http://www.vtsrawl.org)).

Council, whose duties include overseeing the state's scenic road and byways programs. The council's manual, *Designating Scenic Roads: A Vermont Field Guide* (1979), though dated, includes useful inventory information and forms.

At the local level, scenic highway designations are made by the legislative body following a warned public hearing. Planning commissions can nominate roads for designation, or local groups or residents can petition for designation. Once a locally desig-

nated road has been recorded with the state, it may be reconstructed or improved under standards established by the Vermont Transportation Board. Some communities such as Stowe have adopted scenic road policies or ordinances that apply only local criteria to scenic road maintenance and upkeep.

Many municipalities have been reluctant to designate scenic roads because of perceived limitations on the rights of adjoining property owners. The state's scenic highway law specifies that no designation "shall preclude the rights of a landowner from developing property adjacent to a designated scenic road, so long as the development is in accordance with existing law or ordinance." Most scenic road policies and ordinances apply only within the road right-of-way.

Some municipalities have extended the effect of scenic road designation to adjoining lands through their land use regulations, such as through the adoption of scenic corridor or viewshed overlay districts in zoning that apply design standards to development within view of the road. For example, the town of Charlotte recently adopted a "Route 7 Scenic Overlay District" that extends along portions of the Route 7 corridor.

### **Scenic Road Ordinance**

#### ***Example: Town of Stowe***

Stowe first adopted a local scenic road ordinance in 1988 to provide opportunities for public input into any major road changes or improvements (for example, tree clearance, resurfacing, ditching, paving, and upgrading) within the rights-of-way of locally designated scenic roads.

Stowe's ordinance includes:

- procedures for initiating scenic road designation;
- public hearing requirements;
- designation criteria;
- road identification on maps;
- maintenance, reconstruction, and modification standards;
- emergency repair provisions; and
- sign provisions.

The ordinance also includes, for each designated road:

- a description of the designated road section;
- the rationale for its designation, including a description of its scenic characteristics; and
- maintenance standards particular to the road.

The ordinance applies only to land within the road right-of-way. It does not prohibit activities of abutting landowners, nor does it limit new subdivisions or developments along designated roads.